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The significant correlation of annual suicide rates with unemployment rate among males resulted in the rapid increase of the number of suicides in Gifu Prefecture, Japan, between 1990 and 2000

To the editor

The number of suicides in Japan has increased from about 22,000 per year in 1988–1997 to over 30,000 per year since then. This number has also been increasing in Gifu Prefecture. Japan's bubble economy collapsed in about 1990, and the unemployment rates increased rapidly since 1998.¹ Yoshioka conducted a large-scale study of suicide throughout Japan, covering the 7-year period between 1989 and 1995.² He reported that economic difficulties, including unemployment, are an important factor in increased suicide rates. Additionally, many researchers^{1–3} consider increasing unemployment to be a major contributor to the number of suicides; however, thus far, this has not been proved in Gifu Prefecture.

In this report, we examined the suicide rate and all the suicide cases in Gifu Prefecture in 1990–2000, in cooperation with Ministry of Health, Labour and Welfare (Table 1 and Fig. 1). Further, we investigated the unemployment rates throughout Japan in 1990–2000, in cooperation with the Department of Work (Fig. 1). The annual unemployment rate of the entire Japanese population and the unemployment rate are available for each prefecture every five years; however, the annual unemployment rate is unavailable in each prefecture. Therefore, we calculated the correlation between the unemployment rate every five years in the total population and that in Gifu Prefecture, for each sex. The correlations for men and women were $r = 0.96$ and $r = 0.94$, respectively. Accordingly, we considered that the unemployment rate in the total population reflected the unemployment rate in Gifu Prefecture.

We focused on the correlation of annual suicide rates in Gifu Prefecture in 1990–2000 with the unemployment rate

Table 1

The number of suicides in Gifu Prefecture, Japan, in 1990–2000: (population)

Year	Total	Male	Female
1990	370	201	169
1991	310	179	131
1992	365	220	145
1993	354	201	153
1994	365	228	137
1995	343	195	148
1996	339	214	125
1997	396	259	137
1998	511	339	172
1999	495	323	172
2000	489	323	166

in Japan in 1990–2000. Statistical analysis was performed using single regression analysis.

During the test period, 2682 males and 1655 females committed suicide. The suicide rates for males and females were 24.2 and 14.1, respectively, per 100,000 population.

The annual suicide rates for the total population correlated significantly with the unemployment rates: $r(11) = 0.86$, $F_{(1,9)} = 24.73$, and $p < 0.001$ ($y = 2.91x + 9.59$). The rates for males correlated significantly with the unemployment rates: $r(11) = 0.91$, $F_{(1,9)} = 41.35$, and $p < 0.001$ ($y = 4.77x + 8.67$). However, the rates for females did not correlate with the unemployment rates: $r(11) = 0.41$ and $p = 0.21$ ($y = 0.78x + 11.52$).

The unemployment rate is particularly relevant to increased suicides among males. When we analyze these data in detail, we can mention that the annual suicides were relatively static in the first few years of the study and later increase was approximately 50% in the subse-

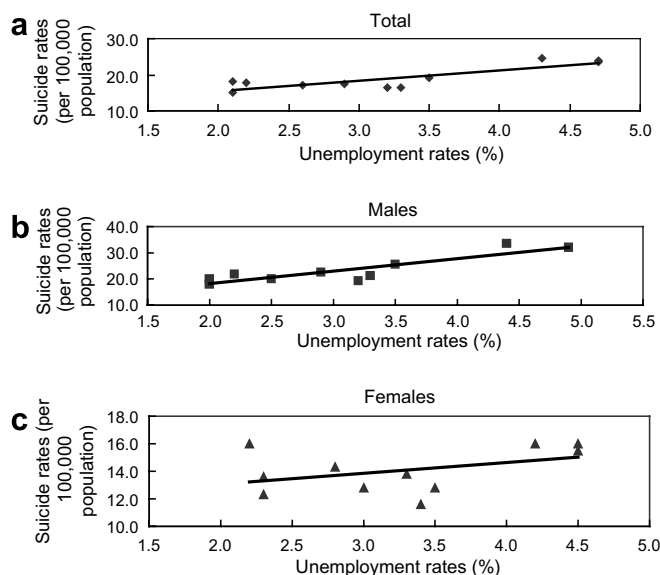


Fig. 1. The correlation between annual suicide rates in Gifu Prefecture, Japan, and the annual unemployment rates in 1990–2000 for the total population (a), males (b), and females (c).

quent 2 year period and then maintained its high level. Hirano et al.⁴ researched that depressive state of unemployed person among males is very strong among 394 unemployed people in Japan. In addition, Higuchi⁵ reported that the correlation of annual suicide rates with unemployment rate among males resulted in Japan. Chida et al.⁶ also found that unemployment is a suicide risk factor in Japan. When economic conditions including unemployment rates worsen, people experience greater stress at their workplace.^{7,8} It should be noted that suicide rates were less related to the unemployment level than to the change in situation from employment to unemployment. Thus, we conclude that psychosocial health care should be considered as part of occupational affairs by industrial physicians, primary care physicians, and psychiatrists, in order to prevent suicide, which is now an increasing national trend. Additionally, we believe that hello work, an occupational organization, and job placement offices should follow up with the unemployed as well as with the disabled.

References

1. Yoshioka N. The present statistics of suicide – necessity for preventive activities. *Rechtsmedizin* 2005;4:279.
2. Yoshioka N. Present status of suicide in Japan, and the preventive application: report of a Grant-in-Aid for Scientific Research (Ministry

of Education, Culture, Sports, Science, and Technology of Japan); 1997 in Japanese.

3. Yamasaki A, Sakai R, Shirakawa T. Low income, unemployment, and suicide mortality rates for middle-age persons in Japan. *Psychol Rep* 2005;96(2):337–48.
4. Hirano K, Yamada K, Hatono Y, et al. *Investigation about suicide prevention of the person among middle-age in the area – investigation about stress of unemployed person and depressive state*. National Institute of Public Health; 2003:47–64 in Japanese.
5. Higuchi T. All of depression – introduction. *J Clin Exp Med* 2006;219:883–9. in Japanese.
6. Chida F, Sakai A, Takayama Y, et al. Social factors of suicide. *Psychiatry* 2006;8:352–8. in Japanese.
7. Inoue K, Kaiya H, Tanii H, et al. The correlation between unemployment and suicide rates in Japan since the 1990s. *J St Marianna Med Inst* 2007;82:81–4.
8. Abe R, Shioiri T, Nishimura A, et al. Economic slump and suicide method: preliminary study in Kobe. *Psychiatry Clin Neurosci* 2004;58:213–6.

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